



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,871	12/19/2001	Hyung Sung Jung	HI-0051	8800
34610	7590	07/03/2006	EXAMINER	
FLESHNER & KIM, LLP P.O. BOX 221200 CHANTILLY, VA 20153			LEE, ANDREW CHUNG CHEUNG	
			ART UNIT	PAPER NUMBER
			2616	

DATE MAILED: 07/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/020,871

Applicant(s)

JUNG, HYUNG SUNG

Examiner

Andrew C. Lee

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 04 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: referring to page 2, paragraph [4], line 2 in the specification for Fig 1, the subject matter “a searcher 100” that are not indicated and found in the Fig. 1; referring to page 9, paragraph [28], line 1 in the specification for Fig. 3, the subject matter “signal searcher 300” that are not indicated and found in the Fig. 3. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

In addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy must be clearly labeled as “Annotated Sheets” and must be presented in the amendment or remarks section that explains the change(s) to the drawings. See 37 CFR 1.121(d)(1).

Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

Specification

2. The disclosure is objected to because of the following informalities:

Proper line or paragraph numbering is required for the Specification.

According to 37 CFR 1.52 (b) (6);

(b) The application (specification, including the claims, drawings, and oath or declaration) or reexamination proceeding and any amendments or corrections to the application or reexamination proceeding.

(6) Other than in a reissue application or reexamination proceeding, the paragraphs of the specification, other than in the claims or abstract, may be numbered at the time the application is filed, and should be individually and consecutively numbered using Arabic numerals, so as to unambiguously identify each paragraph. The number should consist of at least four numerals enclosed in square brackets, including leading zeros (e.g., [0001]). The numbers and enclosing brackets should appear to the right of the left margin as the first item in each paragraph, before the first word of the paragraph, and should be highlighted in bold. A gap, equivalent to approximately four spaces, should follow the number. Nontext elements (e.g., tables, mathematical or chemical formulae, chemical structures, and sequence data) are considered part of the numbered paragraph around or above the elements, and should not be independently numbered. If a nontext element extends to the left margin, it should not be numbered as a separate and

independent paragraph. A list is also treated as part of the paragraph around or above the list, and should not be independently numbered. Paragraph or section headers (titles), whether abutting the left margin or centered on the page, are not considered paragraphs and should not be numbered.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 –15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sih et al. (U.S. 6480529 B1) in view of Krasner et al. (US 6724807 B1).

Regarding claim 1, Sih et al. disclose the limitation of an apparatus for searching a pilot signal that is received through multiple paths in a CDMA mobile communication system (recited “the ability to search multiple offsets of single pilot” as searching a pilot signal that is received through multiple paths in a CDMA mobile communication system; Fig. 6, column 3, lines 43 – 53), the apparatus comprising: a coherent accumulator (recited “coherent accumulator” as a coherent accumulator; Fig. 5, elements 430, 432) that accumulates the despreading signals (Fig. 5, elements 430, 432; column 5, lines 37 – 53); energy calculation means for yielding an energy value using accumulated signals

Art Unit: 2616

from the coherent accumulator (recited "the coherent accumulations of the I and Q data are completed, the resultant values are squared and summed ($I^2 + Q^2$) as shown in energy calculator" as energy calculation means for yielding an energy value using accumulated signals from the coherent accumulator; Fig. 5, element 440, column 7, lines 1 – 5); and a non-coherent accumulator that determines an average value of the energy value for a prescribed time (recited "the results of non-coherent accumulator are delivered to DSP where the values are examined to determine which offset in the search window" as a non-coherent accumulator that determines an average value of the energy value for a prescribed time; Fig 5, element 450, column 7, lines 4 – 22). Sih et al. also teach a shift register bank that sequentially stores PN codes (recited "the PN sequences are generated via linear feedback shift register (LFSR) based PN generators" as a shift register bank that sequentially stores PN codes; column 6, lines 22 – 29); a shift register bank that sequentially stores input signals (recited "I and Q data enters shift registers, respectively. Data is continually loaded and shifted through the shift registers at a constant rate" as shift register bank that sequentially stores input signals; Fig. 2, elements 400, 402; column 4, lines 58 – 63; column 12, claim 9, lines 2 – 7); despreading means for despreading the input signals using the PN codes, wherein the despreading means despreads the input signals in parallel to output despreading signals (Fig. 2, element 410; column 5, 1 – 16). However, Sih et al. do not disclose explicitly a first shift register bank that sequentially stores PN; a second shift register bank that sequentially stores input signals; at least one despreading means for despreading the input signals using the PN codes inputted from the first shift register bank, wherein the despreading

Art Unit: 2616

means despreads the input signals in parallel to output despreding signals. Krasner et al. disclose the limitation of a first shift register bank that sequentially stores PN (recited "PN sequence is shifted into a PN code coefficient shift register" as first shift register bank that sequentially stores PN; Fig. 2A, "element 14 PN code coefficient shift register" as a first shift register bank); a second shift register bank (that sequentially stores input signals (Fig. 2, elements 400, 402; column 4, lines 58 – 63; column 12, claim 9, lines 2 – 7); at least one despreding means for despreding the input signals using the PN codes inputted from the first shift register bank, wherein the despreding means despreads the input signals in parallel to output despreding signals (Fig. 2A, element 11 as despreding means and output ("a set of 1023 logicval values 0 and 1" as output) from element 14 PN code coefficient register" as despreding the input signals using the PN codes inputted from the first shift register bank (column 5, lines 8 – 24, lines 29 – 59). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sih et al. to include a first shift register bank that sequentially stores PN; a second shift register bank that sequentially stores input signals; at least one despreding means for despreding the input signals using the PN codes inputted from the first shift register bank, wherein the despreding means despreads the input signals in parallel to output despreding signals such as that taught by Krasner et al. in order to provide methods and apparatuses for acquiring and tracking Global Positioning System signals or other types of satellite position system signals with a satellite positioning system receiver which includes a matched filter (as suggested by Krasner et al., see column 2, lines 24 – 28).

Regarding claim 2, Sih et al. disclose the limitation of the apparatus of claimed comprising sorting means for sorting more than one average value of the energy value that are output whenever the input signals are sequentially shifted (column 9, lines 19 – 23).

Regarding claim 3, Sih et al. disclose the limitation of the apparatus of claimed wherein the PN codes and the input signals are stored as a separate I component and Q component, respectively (recited “the PN sequences are generated via linear feedback shift register (LFSR) based PN generator” as PN codes (column 6, lines 22 – 29), “I and Q data enters shift registers, respectively” as input signals are stored as a separate I component and Q component; Fig. 2, elements I, Q, PNI and PNQ; 400, 402; column 4, lines 58 – 63; column 5, lines 1 – 3).

Regarding claim 4, Sih et al. disclose the limitation of the apparatus of claimed wherein the plurality of despreading means comprising: first despreading means (Fig. 6C, element 804A as first despreading means) for despreading a first input signal among the input signals using the PN codes (recited “the data in shift register are then correlated with N-bit portions of the I and Q PN sequences (Hereinafter PNI and PNQ)” as first input signal among the input signals using the PN codes; column 5, lines 3 – 16; column 7, lines 32 – 47); and second despreading means (Fig. 6C, element 804B as second despreading means) for despreading a second input signal among the input signals using the PN codes (column 5, lines 3 – 29; column 7, lines 32 – 47). Sih et al. do not

Art Unit: 2616

disclose expressly first despreading means for despreading a first input signal among the input signals using the PN codes inputted from the first registers bank; and second despreading means for despreading a second input signal among the input signals using the PN codes inputted from the first registers bank; wherein the difference between the first input signal and the second signal is $1/2$ chip. Krasner et al. disclose the limitation of first despreading means (Fig. 2A, element 11 as first despreading means) for despreading a first input signal among the input signals using the PN codes inputted from the first registers bank (Fig. 2A, element 14 PN Code coefficient shift register with output with a set of 1023 logical values 0 or 1 as the input signals using the PN codes inputted from the first registers bank; column 5, lines 8 – 29); and second despreading means (Fig. 2A, element 11 as first despreading means) for despreading a second input signal among the input signals using the PN codes inputted from the first registers bank (Fig. 2A, element 14 PN Code coefficient shift register with output with a set of 1023 logical values 0 or 1 as the input signals using the PN codes inputted from the first registers bank; column 5, lines 8 – 29; lines 35 – 59); wherein the difference between the first input signal and the second signal is $1/2$ chip (recited “matched to a full pseudorandom frame, may be thought as a set of 2046 correlators if $1/2$ chip spacing is employed” as the difference between the first input signal and the second signal is $1/2$ chip; column 2, lines 10 – 12; column 3, lines 57 – 63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sih et al. to include first despreading means for despreading a first input signal among the input signals using the PN codes inputted from the first registers bank; and second despreading means for despreading a second

Art Unit: 2616

input signal among the input signals using the PN codes inputted from the first registers bank; wherein the difference between the first input signal and the second signal is $1/2$ chip such as that taught by Krasner et al. in order to provide methods and apparatuses for acquiring and tracking Global Positioning System signals or other types of satellite position system signals with a satellite positioning system receiver which includes a matched filter (as suggested by Krasner et al., see column 2, lines 24 – 28).

Regarding claim 5, Sih et al. disclose the limitation of the apparatus of claimed wherein the first despreading means (Fig. 6C, element 804A QPSK Despreader as first despreading means) and the second despreading means (Fig. 6C, element 804B QPSK Despreader as second despreading means) each comprise a plurality of despreading device means that are equal in number to each of the PN codes and the input signals (Fig. 6C, column 5, lines 1 – 16; column 9, lines 24 – 39).

Regarding claim 6, Sih et al. disclose the limitation of the apparatus of claimed wherein the plurality of despreading device means (Fig. 6C, elements 804A, 804B,..804H) each are coupled to receive one of the PN codes and one of the input signals, respectively (column 5, lines 1 – 6; column 9, lines 24 – 39).

Regarding claim 7, Sih et al. disclose the limitation of the apparatus of claimed wherein the coherent accumulator comprises a plurality of first adders for accumulating the despreading signals (Fig. 5, elements 421A, 423A); and a plurality of second adders

for adding a first accumulation signal and a second accumulation signal, wherein the first accumulation is a signal determined by a first partial coherent accumulation for the PN codes and is stored, and wherein the second accumulation signal is determined by the partial coherent accumulation for next PN codes whenever corresponding next input signals are inputted (Fig. 5, elements 421B, 423B; column 8, lines 10 – 29).

Regarding claim 8, Sih et al. disclose the limitation of the apparatus of claimed wherein the second shift register bank shifts the stored input signals one at a time (Fig. 5, elements 401A, 403A etc. as second shift register bank) and outputs signals corresponding to PN offsets (column 5, lines 1 – 16; column 10, lines 56 – 62).

Regarding claim 9, Sih et al. disclose the limitation of a method for searching a pilot signal received using multiple paths in a CDMA mobile communication system (recited “the ability to search multiple offsets of single pilot” as searching a pilot signal that is received through multiple paths in a CDMA mobile communication system; Fig. 6, column 3, lines 43 – 53), the method comprising: storing PN codes sequentially (recited “the PN sequences are generated via linear feedback shift register (LFSR) based PN generators” as a shift register bank that sequentially stores PN codes; column 6, lines 22 – 29); storing a set of input signals sequentially from a first input signal to a last input signal (recited “receiving a first type of data and operating as a multiple shift registers when receiving a second type of data, for receiving sets of incoming in-phase first or second type of data” as storing a set of input signals sequentially from a first input signal

Art Unit: 2616

to a last input signal; column 10, lines 51 – 62; column 12, lines 22 - 26); despread the set of input signals in parallel by using the PN codes (recited “receiving said set of I data, said sets of Q data, and said PN sequences for producing sets of despread I values and producing sets of despread Q values” as despread the set of input signals in parallel by using the PN codes); outputting an accumulation signal by accumulating despread signals (column 10, lines 64 – 65; column 11, lines 1 – 17; column 12, lines 27 – 31); yielding an energy value of the accumulation signal and an average energy value of the energy value, wherein the average energy value is determined over a prescribed time (column 11, lines 18 – 30; column 12, lines 32 - 37); and determining average mean values corresponding to PN offsets after shifting the set of input signals and repeating the despread to yielding steps (column 11, lines 31 – 33; column 12, lines 38 – 51).

Regarding claim 10, Sih et al. disclose the limitation of the method of claimed wherein the shifting shifts the set of input signals by one so that a penultimate input signal becomes the last input signal and an additional input signal becomes the first input signal, further comprising sorting the energy mean values corresponding to the PN offsets (column 6, lines 33 – 51).

Regarding claim 11, Sih et al. disclose the limitation of the method of claimed further comprising: storing in a buffer more than one first accumulation signal determined by partial coherent accumulation yielded where the input signals are shifted sequentially when a length of coherent accumulation is a multiple of a size of the coherent

accumulation unit; and adding a corresponding more than one stored first accumulation signal and a corresponding more than one second accumulation signal yielded whenever a new partial coherent accumulation results are yielded (column 11, lines 1 – 23).

Regarding claim 12, Sih et al. disclose the limitation of the method of claimed wherein the addition is performed corresponding to an order of storing said more than one first accumulation signals in the buffer and an order of yielding said more than one second accumulation signals (recited “an I accumulator for receiving said complete I sums and accumulating them in sets to produce a set of accumulated I sums” as performed corresponding to an order of storing said more than one first accumulation signals in the buffer, and recited “an Q accumulator for receiving said complete Q sums and accumulating them in sets to produce a set of accumulated Q sums” as an order of yielding said more than one second accumulation signals; column 11, lines 1 – 30).

Regarding claim 13, Sih et al. disclose the limitation of the method of claimed wherein the despreading is executed after a prescribed number of the PN codes and the input signals are stored (column 12, claim 11, lines 20 – 37).

Regarding claim 14, Sih et al. disclose the limitation of the method of claimed wherein a number of the despreading signals is determined by the coherent accumulation unit length (recited “each sum is an N-chip coherent accumulation of a particular offset” as number of the despreading signals is determined by the coherent

accumulation unit length; column 5, lines 37 – 40, lines 51 – 61).

Regarding claim 15, Sih et al. disclose the limitation of method for searching a pilot signal received using multiple paths in a CDMA mobile communication system (recited “the ability to search multiple offsets of single pilot” as searching a pilot signal that is received through multiple paths in a CDMA mobile communication system; Fig. 6, column 3, lines 43 – 53), Sih et al. do not disclose expressly the method of claimed wherein the input signals are divided into a first input signal and a second input signal and each signal has a gap of $1/2$ PN chip. Krasner et al. disclose the limitation of the method of claimed wherein the input signals are divided into a first input signal and a second input signal and each signal has a gap of $1/2$ PN chip (recited “matched to a full pseudorandom frame, may be thought as a set of 2046 correlators if $1/2$ chip spacing is employed” the input signals are divided into a first input signal and a second input signal and each signal has a gap of $1/2$ PN chip; column 2, lines 10 – 12; column 3, lines 57 – 63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sih et al. to include the method of claimed wherein the input signals are divided into a first input signal and a second input signal and each signal has a gap of $1/2$ PN chip such as that taught by Krasner et al. in order to provide methods and apparatuses for acquiring and tracking Global Positioning System signals or other types of satellite position system signals with a satellite positioning system receiver which includes a matched filter (as suggested by Krasner et al., see column 2, lines 24 – 28).

Response to Arguments

5. Applicant's arguments filed on 04/04/2006 with respect to claims 1 – 15 have been fully considered but they are not persuasive.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Lee whose telephone number is (571) 272-3131. The examiner can normally be reached on Monday through Friday from 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



RICKY Q. NGO
SUPERVISORY PATENT EXAMINER

Application/Control Number: 10/020,871
Art Unit: 2616

Page 15

ACL

June 27, 2006